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## FEEDING EXPERIMENTS ON POLISTES WASPS.

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The behavior of *Polistes pallipes* is extremely interesting when they are fed on larvae of the same species from other nests.

The wasps experimented with were made distinguishable from one another by little smears of paint on their bodies. Thereafter it was most convenient to make and keep Indian-like names for them based upon their distinguishing marks. The nests were fastened about the laboratory window frames, just above a porch roof.

On one orphan nest, No. 108, the foster-queen, known as "faint-yellow," was offered a small dead larva from another nest of her own species. She promptly took it from the forceps, held it in her fore-legs, malaxated it thoroughly and chewed off the head and dropped it below. As further manipulation was going on, the mass became smaller, and it was soon evident that she was reserving this morsel for private consumption. It was interesting to see how she cleared the body of the intestine, that bag containing the accumulated refuse of the insect, now forming a hard, gritty substance which she declined to eat. When she had eaten the desirable portion, the mass was reduced to one-fourth its original size. This waste matter she discarded in a very pretty fashion: holding it between the toes of one outstretched foot, she daintily tossed it away to the sill below. Repeated offerings of this material met with her refusal. When a second whole larva was offered, however, it was accepted, worked over in the same manner, the intestinal bag squeezed out of the mass and dropped on the sill. She then ate her fill of this one, but it was too much for her, and she fed the remaining portion, about one-third, to the larvae in the various cells.

"Small-dot" was a younger sister on the same nest. When she was offered the same diet she willingly took it from the forceps and dashed away on the wing with it, but soon returned empty-handed. While she was gone I again offered to "faint-yellow" a large larva. She was at the time hanging from the under side of the nest, and had a hard struggle to hold on and manipulate so large a portion. But she seemed to realize her position, and soon carried her burden to the roof of the nest where a good foothold was assured and continued with the process of malaxation. While she was thus engaged, "small-dot" returned and found her occupied with her cannibalism; she immediately grabbed the other end of the larva in her jaws, and I thought they were going to peaceably divide the body in half and each take a portion, as they do when they are eating caterpillars. But instead, a tug-of-war ensued which lasted for several minutes, each queen furiously pulling the unfortunate larva in an opposite direction. At length "small-dot" was victorious, got full possession of the larva, flew out and dropped it on the roof three feet away and flew off. I picked it up and returned it to "faint-

yellow" who welcomed it as one would a lost purse, and promptly resumed her malaxation of it. After ten minutes "small-dot" returned but the cannibal, criminally alert, must have spied her before I did, for just as "small-dot" was landing on the nest, "faint-yellow" flew to a place on the porch roof, three feet away, taking her cherished property with her, where she escaped the notice of her antagonist. There for more than ten minutes she kneaded the mass, then she bit off a portion, about one-sixth of it, made a most beautiful flight of orientation over the remainder (even though it was so short a distance from home), flew to the nest and fed this portion to several larvae. "Small-dot" evidently did not recognize the material, for she made no attempt to get it away. I gave "small-dot" another larva, thinking that probably she was reconciled to cannibalism since she tolerated this last move; she seized it and pulled it from the forceps so vigorously that I thought she really wanted it for herself, but no, she carried it out and threw it away. Despite the intricate flight of orientation which she had made over the remains of her prey, "faint-yellow" never returned to it for another mouthful. Another large prepupa was placed on the roof of the nest when "small-dot" left; "faint-yellow" appropriated it, worked up a portion into palatable viands and took it down to feed the larvae, then dragged the remainder of the carcass to an out-of-the-way spot on the roof and discarded it.

The above-described conduct of this foster-queen was probably exceptional behavior. Nest "W" showed somewhat different results, but this latter nest at that time contained four adults and a number of capped cells and eggs but no hungry larvae, whereas the former nest had, besides the queen and one worker, eight large larvae demanding food. While "small-dot" might have instinctively objected to the behavior of her foster-queen, I must mention that in the eight hours that I spent about the nest that day, she always returned empty-handed, and even at 7.30 p.m., when it was dark, "small-dot" had not yet returned. Is it possible that she lacked the average keenness in recognizing all prey? While "small-dot's" conduct in rejecting the flesh of her own species was doubtless guided by instinct, yet "faint-yellow," though her actions were those of desperation, yielded to the pressure of the need for saving her progeny from starvation, thereby doing her part in the survival of the species. May it not be that the realization of her obligation to dependents made her course of action different from what it would have been had she been alone in the world?

Now let us consider the behavior in nest "W," with four adults and no feeding young. While none of the adults would tolerate these larvae of their own kind from other nests, each one reacted differently from the others. They all readily took the food from the forceps. One, known as "white-and-yellow," dropped its first one to the floor without leaving the nest, and carried the second one away on the wing and discarded it. "Blue-wing" grasped hers tightly, but "white-and-yellow" pounced upon it also; a tug-of-war ensued, until "white-and-yellow" succeeded in wrenching it away and carried it off also and dropped it twelve feet away. This began to look like behavior similar to that of "small-dot." A second larva was given to "blue-wing"; she walked two feet up the wall, paused and malaxated it for three minutes and then indifferently dropped it and walked back to the nest. With her third, she again walked to the same spot, thence a distance of six feet across the porch roof and there abandoned

it also. This seemed to be her idea, or at least her way, of disposing of these annoyances, for she repeated this performance exactly with the next three that were given her. "White-thorax" refused to take the food from the forceps in three out of five trials, and in the two cases in which she did accept it she immediately dropped it to the ground; she kicked overboard another one which was placed on the roof of the nest as soon as she discovered it. In considering the fact that all four of these adults refused these offerings, we must admit, from the following observations, that the rejection was due to visual perception rather than to the sense of taste or scent. The next larva that was offered was alive, and in touching the nest with its mouth it emitted a large drop of saliva; this was immediately lapped up by two of the adults before they gave any attention to my offering or, in fact, seemed aware of its presence. After I had grown tired of this form of experimenting, I took portions of the juicy larva and rubbed them in various places on the nest. This wet, sticky material was greedily devoured by all four of the adults which a few minutes before had refused the whole carcass while it was yet recognizable, or before the juices were exposed. Therefore I say that the whole larvae were rejected on account of the familiarity of their physical appearance, and not because of scent or any other mystical means of detecting blood relationship.

On the following day the tests were all repeated. On that occasion, in the first nest "small-dot" refused this food six times when it was offered to her; "faint-yellow" accepted it and used it just as she did previously. In the second nest, all four adults again refused to accept repeated offerings. A full-grown larva was placed on the roof of the nest; the first adult which saw it completely drained its mouth, then the wasp carried it from the nest and dropped it as if discarding rubbish. There were no larvae in this nest at the time, and saliva was therefore rare and heartily relished.

On August 8, two weeks later, these tests were repeated. At that time three of the four marked wasps previously tested on the second nest (W) were still present. Five different larvae were in turn offered to the individuals of this trio. Each larva was complacently taken in the wasp's jaws and dropped below. The sixth one was offered first to "blue-wing"; she took it in her mouth, walked to the roof of the nest with it, held it with an air of utter indecision for three whole minutes and at last dropped it below also. A seventh was offered to "white-thorax"; she at last yielded to my insistence—I longed to read her mental process in this radical change of conduct—and took this one in her mouth and worked into pulp. Meanwhile, other eyes than mine had noticed her change of conduct, and her new course of action was challenged, for "blue-wing" made a fierce though unsuccessful attempt to wrest it from her, but whether for aesthetic or selfish reasons I cannot say. After "white-thorax" had finished her feast and had disposed of the ball of refuse in the usual way, a second larva was handed to her. She immediately pounced upon it as if now appreciating a good thing when she saw it, and attempted to work it up, but the others this time discovered her and succeeded in taking it away from her. Their purpose, in this instance at least, was now evident, for jointly the two began energetically malaxating the larva. After a minute, "white-thorax" usurped the place of one of the others and these two proceeded with the work together, while an additional larva fell from my

munificent forceps into the jaws of the bereft "two-dots." So then everybody was happy; all three wasps were enjoying the strange food which only two weeks previously they had all steadfastly refused; now the eager forelegs and maxillae all seemed to reveal in the feast. The wasps skinned the larvae, squeezed out the viscera, ate part of the meat and chewed the remainder to pulp and fed it to the young.

"Two-dot" then received another larva, and so also did "white-thorax." The last one was full-grown and almost too large for her to handle, but she struggled bravely with it until "blue-wing" came to her assistance. All three were again contentedly engaged, and soon the fat larva was being kneaded into viands. The heavy alimentary tract was dangling down, and despite their customary efforts at squeezing, it refused to drop. "Blue-wing" was resourceful, however; while "white-thorax" firmly gripped and steadied the load, "blue-wing" flew a short distance away from the nest, then turned and flew "full steam ahead" at the dangling mass, grabbed it in her jaws as she passed and thus augmenting her natural strength with momentum, she tore it off at the right point, and while still in flight dropped it a little further beyond. They then divided and devoured the good portions. With this, they had had enough, for when four others were offered, the various wasps took them with an indifferent or bored mien and immediately dropped them. When I appeared with a fifth, however, and offered it to one of them, she at once assumed an air of extreme annoyance or anger, snatched it and angrily flew to a distance and flung it away in her flight. I took the hint and offered no more.

Now it is highly interesting that on this day, with just a little coaxing, I got all the adult members of this family to accept something which only a few days before they had refused so stubbornly. Why the change? Did they learn so suddenly that this material is good, or was it a case of deferred instinct? The indications are that both factors enter into the case. In the days of their flat refusal to partake of this strange food, they had no larvae dependent upon them for nourishment; the nest contained only sealed cells and eggs. At the later date there were nearly a dozen larvae; with so many mouths to feed, it were little wonder if they cared not what their food was or whence it came. It is well known that other animals show increased ferocity when they are worried by the care of a large number of young; why should not wasps? New interests and the pressure of necessity were upon them, and they gladly accepted that to which they had been indifferent before, or which they could afford in the first instance to scorn as undesirable. Is this, then, to be called deferred instinct, *i.e.*, certain traits developing only when the wasps became of a certain age? Or is it probable that, regardless of age, the presence of hungry young in the nest aroused the cannibalistic appetites? Or would it be more nearly correct to say that all had refused to eat their own kind some time before, and that even today they stood firm on their prejudices and the first six larvae were refused, but that frequent repetition of the offer broke down the barrier and at last in the seventh trial one accepted it, whereupon it eventually learned that it was good, and all the others imitated this one?—Oh, where may we find one free end in the tangle, whereby we can unravel the complication! The interpretation is made all the more complex by the refusal of these wasps to take the larvae, while at the same time greed-



ily eating of the smear made from their crushed bodies. This last point would indicate that while the material or odor was not repugnant to them, its form was, but they later overcame this prejudice. It's a Pandora's box of problems; I almost wish I had never lifted the lid and set them all buzzing about!

On this same date the first nest was also further studied. While a dozen adults on other nests refused *Polistes* larvae as food, queen "faint-yellow" still relished them. During my absence, two new adults had emerged on this nest. These were offered the larvae on forceps as usual, and their refusal to accept them was very decided. However, a little later in the day, when a larva was given to the queen, she insisted upon poking it under the very noses of these two young ones, and soon all three were voluptuously rolling parts of the morsel in their jaws and forelegs. After that these youngsters readily accepted the flesh of their brethren. It seems to me undeniable that this was a case where the mother deliberately taught her young—or I should say, the foster-queen taught her sister workers—this little detail of the art of *savoir vivre*. There was also at that time a third new unmarked worker on the nests, which was at first overlooked because it was in hiding between the wall and the nest while the queen and two sister workers were busy with their ball. I offered some of the same material to this newcomer, but she coldly refused it. After twelve offerings, she deigned to remove the larva from the forceps, but dropped it off the nest. All this while, the other three were chewing at their morsels, as they had been doing for the last half-hour. This child, it seemed, was "out of sight, out of mind," and had not been taught by the queen as were the others, and evidently did not learn at once by observing them.

The next morning at eight o'clock, two strangers that had just emerged from other nests were placed on this nest; one walked up the wall and stupidly got lost, while the other immediately made itself at home. The residents gave her very little attention, except an occasional touch with the antennae, but this greeting was extended to the members of their own family as well. This stranger, ten hours old, received a dab of white paint on her side and was thereafter known as "white-side."

This provincial, young and unsophisticated wasp, absolutely refused to accept *Polistes* larvae as food, despite my persistence in placing them before her. There was nothing inherently objectionable about this particular larva, for the queen took it gladly a moment later. I offered to the stranger another larva with its mouth overflowing with saliva. She took it in her fore-legs, drained the saliva and then malaxated the neck, probably at first to induce more secretion. Next she worked with it, more or less aimlessly, for five minutes, and then gently laid it on the roof of the nest where she was standing and walked away. Apparently she had not yet learned what to do with it. She hesitated and demurred, returned and took it up in her jaws and threw it bodily below. Other larvae were offered to her, but she repeatedly refused them.

The queen "faint-yellow" had with all her experience by this time improved beautifully in the art of skinning a larva. She would work and knead the larva in her jaws until the entire entrail was dislodged and hanging down; then with a well placed bite with her jaws she would snip it off and it would drop to

the ground. Next she would work up the pulp and even the body wall, rich as it is in muscle tissue, for food for herself and the young ones under her care.

Next the newcomer's appetite was tempted with green cabbage caterpillars. These also she refused, although *P. pallipes* generally like them and are often to be seen hunting for them in the cabbage patch. This action would indicate that the young wasps either must be taught to distinguish their food, or must wait a certain time, like the kitten, for their hunting instincts to appear and function.

A third wasp, "two-dots," returned to the nest. This one also twice refused the proffered cabbage-worms. The queen, however, only a few seconds after she had disposed of the last fragments of a *Polistes* larva, eagerly pounced upon one of these at the first sight of it and worked it up into hash. The stranger was so near that she almost touched the queen when all this happened. "Surely," I thought, "she will take the cue!" But a writhing worm held before her nose again met with her refusal. Thus the process of change does take time; they must either grow into moods or imitate. We eagerly await the next step, to see to which of these processes it will point.

When stranger "white-side" refused the worm, I laid it, to get it out of the way, on the roof of the nest. When I attempted to remove it fifteen minutes later, "two-dots," who just before had refused this caterpillar, snapped and feigned fight at my forceps. She took possession of it, picked it up by the tail and hung head downward from the lower side of the nest, still holding the dangling caterpillar by one end—a spectacular performance! Thus she quietly held it for several minutes, until I could not tell whether she intended to drop it, to fly with it, or to devour it. She herself appeared undecided. When at last the caterpillar began suddenly to wriggle, that seemed to affect her like waving a red flag before a bull; she gripped it nervously and began furiously to malaxate it from the tail to the head, thereby stunning the nerve cord and seeming thus to quiet the victim. Then, without stinging it, she worked it up in the usual way, as if she were quite accustomed to the task, shared the ball with her foster-queen in a most companionable manner and fed a portion of it to the young in the cells.

#### SOME NEW NEARCTIC DIPTERA.\*

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DOLICHOPODIDAE

#### *Rhaphium ciliatum* n. sp.

Related to *crassipes* Meigen, to which it traces in my key (Tr. Royal Can. Inst., XV, 252, 1926). It is readily distinguished by the wholly black posterior femora, presence of abundant erect black hair on the upper surface of the anterior tarsi and in having the basal segment of the anterior tarsi shorter than the following three segments instead of longer than the apical four segments. Length 4.75 mm.

*Male.* Face narrow, silvery white; front shining green; occiput thinly

\*—Contributed from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

ashy pollinose and white pilose; palpi brownish, with fine, short whitish hairs. Third antennal segment not two and a half times as long as wide, sub-triangular; arista one and a third times as long as antenna.

Thorax green, the pleura grey pollinose, mesonotum thinly so and with a pair of dull blackish vittae on the anterior two-thirds; pleural pile white.

Anterior four legs yellowish, the anterior femora on more than the basal half, apical two segments of the anterior four tarsi and the posterior legs, black; posterior tibiae on apical fourth and on the dorsal surface, brownish red. Anterior femora white haired behind, the legs elsewhere with short black hair. First segment of the front tarsi strongly swollen apically, the remaining segments deeper than wide, the dorsal surface with abundant erect black hair which is slightly longer than height of tarsal segments. Apical two segments of middle tarsi broadened as in *crassipes*.

Wings cinereous; third and fourth veins rather strongly approximate on apical portion; anal vein undulate.

Abdomen deep green, thinly whitish pollinose, the hairs of the second to fourth segments and the apical two or three black. Genitalia black, grey pollinose, lamellae as in *crassipes*, long and narrow, with a short, acute lobe near the middle.

*Holotype*—♂, Agassiz, B.C., May 31, 1927, (H. H. Ross), No. 2754 in the Canadian National Collection.

#### HELEOMYZIDAE

### **Criddleria** new genus.

Allied to *Oecothoa* Haliday from which it is at once distinguished by the following characters: Presence of two pairs of orbital bristles, the anterior pair smaller and divergent; absence of a row of short bristles on postero-ventral surface of the middle tibiae, presence of a pair of strong presutural bristles in both sexes, and the presence of two or three sternopleural bristles, the third or anterior one of which is small. In all the specimens the wings are represented by only the costa and the area lying before the basal cell. Each abdominal segment except the first bears a marginal row of bristles. Bristles of legs arranged as follows: a postero-dorsal and postero-ventral row on anterior femora; antero-ventral row of strong and antero-dorsal row of short, weak bristles on middle femora and also an apical posterior bristle; three or four antero-dorsal and dorsal bristles on the apical fourth of the posterior femora and a row of three to six antero-dorsals on the middle tibiae. Genotype—*C. hemiptera* n. sp.

In the key to the genera given by Aldrich (Ins. Ins. Mens., XIV, pp. 96-102, 1926) this genus traces to couplet 6 where the arrangement of the sternopleural bristles even when three are present, throws it out of either alternative. The presence of two pairs of orbitals at once separates it from *Oecothoa* in couplet seven, and the presence of only two pairs of scutellars distinguish it at once from *Diacia*.

**Criddleria hemiptera n. sp.**

Blackish, the head, trochanters, tibiae and tarsi reddish or brownish red. Length, 3.75 to 4.5 mm.

♂ ♀ —Head dark brownish red, the occiput above and upper third or more of the front, blackish, the front rarely dark reddish brown; occiput and three triangles on the upper part of the front grayish pollinose, the face and cheeks obscurely pale pollinose. Front with short, black hair; ocellars strong; two pairs of strong verticals; post-ocellars convergent; occipital hair sparse, black; cheeks bare except along the oral margin, as wide as eye-height, the eye very little higher than wide; antennal grooves of moderate size; facial plate rather prominent, wide. Palpi with black bristles below. Third antennal segment blackish; arista long, slender, sparsely short pubescent.

Thorax with moderately thick greyish ochreous or grayish pollen. Acrosticals, 0-1; dorsocentrals, 1-3; intra-alar absent; one supra-alar; two notopleural bristles; one humeral; presutural present; two pairs of marginal scutellars, the apical pair sub-erect and cruciate; two or three sternopleurals in a horizontal row on posterior half of the sternopleura; a single propleural. Pleura and scutellum without hairs.



Legs black, the trochanters and posterior surface of front coxae reddish; tibiae usually brownish red or ferruginous on sub-apical half.

Wings (see figure) with only the costal vein, first and second veins entire, the auxiliary vein distinct; the veins, however, approximated, the remaining veins represented by basal stumps; costal bristles moderately strong.

Abdomen thinly grey pollinose; ♂ genital segments largely reddish.

*Holotype*—♂, Aweme, Man., Nov. 2, 1927, (S. Criddle), No. 2771 in the Canadian National Collection.

*Allotype*—♀, same data.

*Paratypes*.—Over 100 specimens, same data.

This peculiar species was found in the nests of the pocket gopher *Thomomys talpoides rufescens* and the flies were very abundant in some nests. Larvae were also present but specimens have not yet been reared. While the wings have the appearance of having been chewed off in some manner owing to the irregularity of the posterior part, the evenness and uniformity of the costal region would seem to indicate that the membrane is for the most part normally absent and this is borne out by the slight approximation of the longitudinal veins. The normal condition of the wings can only be determined by rearing.<sup>1</sup>

1.—Since the above article was prepared information has come to hand that in freshly emerged specimens the wings are entire and that the loss of the wing membrane occurs later. Ed.



## TACHINIDAE

**Eutheresia Towns.**

1. Band of fourth vein with appendage ..... 2.  
    Band of fourth vein without appendage ..... 3.
2. Third and fourth segments with a median, posteriorly tapering pale, pollinose vitta (Ill.) ..... *interrupta* n. sp.  
    Third segment shining black on posterior half, the fourth wholly pollinose (Ont.) ..... *trivittata* n. sp.
3. Front over three times as wide as ocellar triangle ..... *canescens* Walker.  
    Front twice as wide as ocellar triangle ..... *montana* West.

**Eutheresia interrupta n. sp.**

Black, the palpi and antennae bright reddish. Length, 7 mm.

♀.—Head white pollinose; frontal vitta blackish brown, wider in front than parafrontal. Front almost as wide as either eye, seven or eight pairs of frontals, the upper pair reclinate; two pairs of proclinate orbitals, the parafrontals with a few scattered, coarse hairs. Outer verticals one-third as long as verticals; occiput with pale pile only below the neck. Cheeks slightly over one-third as wide as eye-height, black haired. Parafacials two-thirds as wide as median depression; facial ridges with short hair on lower one-third; vibrissae almost level with oral margin. Antennae five-sixths as long as face; arista and its rays black.

Thorax greyish pollinose, with three strong black vittae; acrosticals 2-2 or 1-2; dorsocentrals 3-4; posterior sub-lateral and posthumeral bristles absent; sternipleurals 1-1; three pairs of marginal scutellars; propleural hair black; infrascapular setulae absent.

Legs black; middle tibiae with two antero-dorsal bristles; posterior tibiae not ciliate.

Wings cinereous hyaline; fourth vein with short appendage at bend; third vein with three basal setae. Squamae whitish. Halteres luteous, partly brownish.

Second to fourth abdominal segments with hardly the basal half and a triangular median vitta, greyish pollinose, the vitta on the second segment not entire. Second segment with pair of marginals, the third and fourth each with a row. Hair black, appressed.

*Holotype*.—♀, Ill., in Illinois State Natural History Survey Collection.

**Eutheresia trivittata n. sp.**

Black, the palpi and antennae dark reddish; thorax with three shining black vittae. Length, 11 mm.

♀.—Head dull greyish pollinose, less thickly so near the vertex; frontal vitta blackish, in front wider than parafrontal. Front practically as wide as either eye; ten or twelve pairs of frontals, the upper pair reclinate; two pairs of orbitals; parafrontals with many hairs; ocellars long; outer verticals half as long as verticals; pile of occiput whitish; two irregular rows of black setulae behind the occipital cilia. Cheeks black haired, half as wide as eye-height. Parafacials three-fourths as wide as facial depression; facial ridges with bristly hairs on lower third; vibrissae level with oral margin; antennae reaching lowest sixth of face; arista black, moderately long plumose.

Thorax moderately grey pollinose. Acrosticals 1-2; dorsocentrals 3-4; posterior sub-lateral absent, posthumeral present; three pairs of marginal scutellars, the apical pair cruciate, sternopleurals 1-1; propleural hair black.

Legs black; middle tibiae with three or four antero-dorsal bristles; hind tibiae not ciliate.

Wings cinereous hyaline; bend of fourth vein with short appendage; third vein with two or three basal setae. Squamae whitish, with yellow rim. Halteres brownish.

Second abdominal segment moderately whitish pollinose on basal half, the pollinose band narrowed in the middle, the third segment similarly pollinose on the basal third; and fourth segment wholly pollinose, thinly so apically. Second segment with pair, third and fourth each with a row of strong marginals: hair appressed.

*Holotype*.—♀, Rondeau Point, Ontario, June 21, 1922 (A. W. Baker), No. 2759 in Canadian National Collection.

*Paratype*.—♀, same data.

#### NOTES ON THE IDENTITY OF THE PROVANCHER SPECIES OF ARCTOCORIXA (CORIXIDAE, HEMIPT.)\*

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While collecting during the spring and early summer of 1927 in the vicinity of Ottawa, Ontario, Canada, the writer secured large numbers of two species of *Corixidae* which on verification proved to be *Arctocorixa bilineata* Prov. and *Arctocorixa trilineata* Prov. To Mr. George Maheux, Provincial Entomologist for Quebec, Canada, the writer is indebted for his comparison of this material with the Provancher types in the Quebec Public Museum.

From Mr. Maheux's observations it is evident that *A. trilineata* Prov. has been incorrectly figured by Abbott (Hemipt. Conn.) and as this constitutes the first record of *A. bilineata* Prov. since its discovery, the following notes are presented as a contribution to our knowledge of these two species.

#### **Arctocorixa bilineata** Provancher.

Figs. 1, 2, 3.

*Corisa bilineata* Prov., Nat. Can., IV, p. 108, 1872.

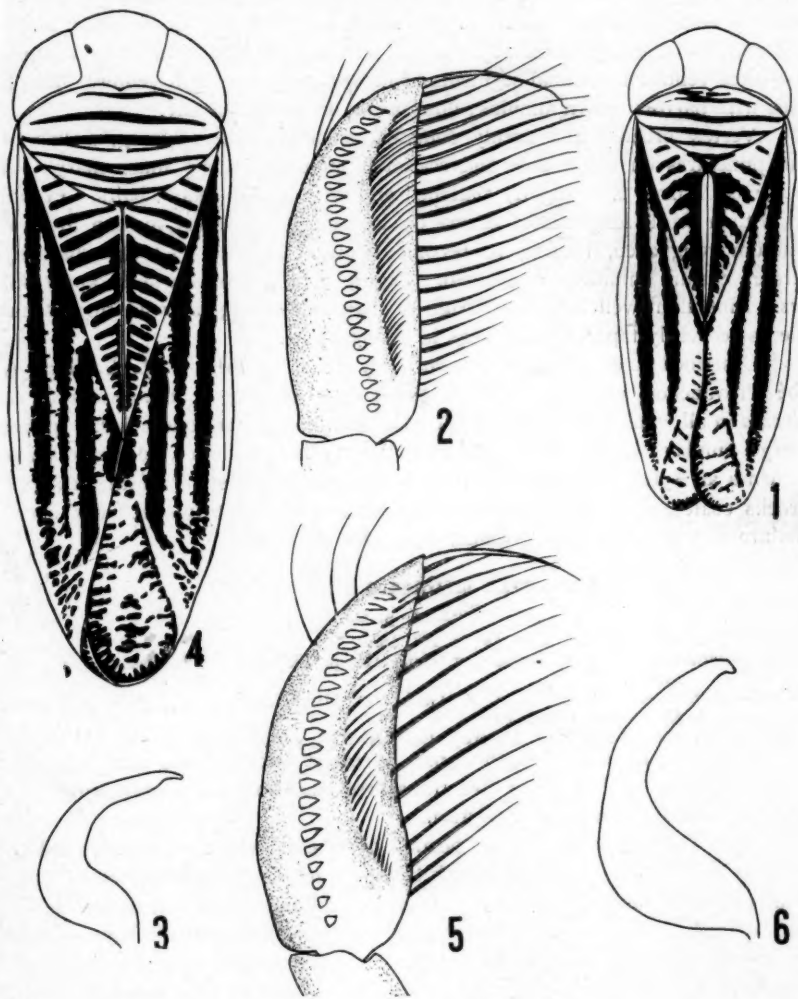
*Corisa bivittata* Prov., Pet. Faune Ent. Can., III, p. 203, 1888. (name changed).

*Arctocorixa bilineata* Blatchley, Heterop., East. N. Am., p. 1077. No. 1230, 1926.

*Male and Female*: Length 4 mm., greatest width across head 1.4 mm. In general robust, rather pale lemon yellow with transverse black lines on pronotum and two longitudinal black lines on each elytron.

Head pale yellow with brownish in region of mouth parts. Eyes brownish black. Pronotum yellow with five or six transverse dark lines, the most anterior two usually confused and not attaining side margins of pronotum; the following three rather narrower than inter-linear spaces and attaining side margins. Commissure of hemelytra margined with pale yellow. Clavus yellow

\*—Contribution from the Department of Zoology and Entomology, Iowa State College, Ames, Iowa.



Figs. (1-3) *Arctocorixa bilineata* Prov., (1) ♂, dorsal aspect, (2) palae of ♂, (3) clasper of ♂ genitalia.

Figs. (4-6) *Arctocorixa trilineata* Prov., (4) ♂ dorsal aspect, (5) palae of ♂, (6) clasper of ♂ genitalia.

with irregular oblique dark bars which fuse adjacent to the pale commissural line. Corium yellow with two well defined longitudinal black stripes which fuse anteriorly along the claval suture. Membrane area yellow with irregular blackish flecks, most conspicuous adjacent to corium and along the inner margin. First three ventral abdominal segments brownish, margined with yellow. Middle tarsus with narrow brown annulus; hind tarsus brownish apically.

Vertex broadly and evenly rounded, smooth, rather shining, a line of weak punctures on either side and scattered punctures along inner margin of eye. Face in male only slightly flattened and with sparse yellow hairs. Pronotum with a weak longitudinal carina on its anterior portion; median area of pronotum roughened, tending to become rastrate laterally. Clavus obscurely rastrate; corium minutely roughened. Elytra with a few scattered appressed hairs. Embolium well defined. Strigil of male oval-triangular with three striae. Male palae evenly tapering with pegs in a single row.

Described and recorded hitherto only from Quebec, P.Q., Canada, by Abbé Provancher who records this species as occurring in numbers with *A. trilineata* in all waters in the environs of Quebec. The writer collected this species in large numbers during May and early June along the stony shore of Lake Deschenes at Aylmer, P.Q. and Britannia, Ont. Specimens were found clinging to rocks coated with algae in the same situations as *A. trilineata*. Six specimens are also at hand from Aweme, Manitoba (Criddle).

#### **Arctocorixa trilineata** Provancher.

Figs. 4, 5, 6.

*Corisa trilineata* Prov., Nat. Can. IV, p. 108, 1872.

*Corisa trivittata* Prov., Pet. Faune Ent. Can., III, p. 203, 1888, (unnecessary change of name).

*Arctocorisa trilineata* Abbott, Conn. St. Geol. Nat. Hist. Survey Bul. No. 34, Pub. Doc, 47, Pt. IV, p. 389, 1923.

*Arctocorixa trilineata* Blatchley, Heterop. East. N. Am., p. 1076, No. 1226, 1926.

*Male and Female:* Length 6 mm., greatest width across head 1.8 mm. In general yellow with four or five transverse blackish lines on prothorax and three longitudinal black lines on elytron.

Head yellowish with median portion of face brownish. Pronotum yellow with four or five wavy transverse dark lines, the most anterior one not attaining side margins of pronotum, the two or three middle lines often forked and abbreviated laterally. Inter-spaces broader than the lines themselves. Clavus yellow with oblique dark markings which tend to form bars which fuse along the pale commissural line and occasionally are forked and joined at their apices. Corium yellow with vermicular blackish markings which fuse to form three well defined longitudinal lines. Membrane region yellow with scattered vermicular blackish flecks massed in centre and along margins. Embolar margin yellowish, fuscous at base and apex. Three or four basal abdominal segments blackish except at margin. Sternum with brownish markings. Middle tarsus with brown annulus, hind tarsus brownish apically.

Vertex broadly and evenly rounded, shining, punctate as in *A. bilineata* Prov. Face distinctly flattened in region below eyes. Pronotum with weak longitudinal carina obsolete posteriorly. Pronotum obscurely and clavus mod-



erately rastrate, corium finely roughened. Male strigil small with five striae. Male Palae evenly tapering with pegs in a single row.

Described from Quebec, P.Q., Canada and reported by Provancher to be common in that locality. The pale pala of this species has been erroneously figured by Abbott (Hemip. Conn. p. 388, fig. 14) and by Blatchley (Heterop. East. N. Am., p. 1064, fig. 14). Large numbers of this species were collected during May and June from Lake Deschenes near Ottawa, Ontario. Mr. Maheux on comparing a series with Provancher's type, states: "Your conviction as to the paler arrangement is correct. The pegs are arranged in a single row and the palae have an elongate triangular form, not the rectangular shape illustrated by Abbott. Your specimens compare exactly with Provancher's type."

The distribution of the species in the Ottawa region is as follows: Aylmer, P. Q. (Apr., May, June); Fairy Lake, P.Q. (Aug.); Britannia, Ont. (Apr., May, June).

## TWO NEW LITHOBIOD CHILOPODS.

BY RALPH V. CHAMBERLIN,

Stanford Univ., Calif.

The two chilopods described below were found in collections recently sent me for identification by the Federal-Horticultural Board and by Mr. R. D. Harwood of Cornell University. The types are in the author's collection.

### **Nipponobius** gen. nov.

Similar to the North American *Nadabius* in having the fifth joint of the anal legs of the male with a conspicuous dorsal crest at distal end, but differing in having the tarsus of all legs excepting the anal and penult strictly undivided, and in a reduced spining of the legs. Antennae composed of twenty articles. Prosternal teeth 2 + 2. Posterior angles of none of the dorsal plates produced.

Genetype.—*Nipponobius migrans* sp. nov.

### **Nipponobius migrans** sp. nov.

Dorsum and last two pairs of legs light, yellowish brown, the antennae similar proximally but paler distally; legs yellowish. Head with marginal breaks distinct. Antennae short. Ocelli in two series; 1 + 3, 3. Presternal teeth pale, small, carried well forward. Coxal pores small, circular, 1, 2, 2, 2. Ventral spines of anal legs 0, 1, 2, 1, 0; dorsal spines, 0, 0, 2, 1, 0, with two claws. None of posterior coxae laterally armed. Ventral spines of first legs, 0, 0, 0, 0, 1. Fifth joint of anal legs of male moderately longitudinally sulcate above, with the posterior end elevated into a crest which is highest caudally and rounded distally, not laterally compressed; tarsal joints abruptly more slender.

Length of male holotype, 5 mm.

Locality.—The types were taken at quarantine in Philadelphia on lily bulbs imported from Saitama, Japan.

In addition to the adult male holotype, there are two immature specimens.

### **Tidabius aberrans** sp. nov.

Head and dorsum anteriorly and posteriorly chestnut brown, the middle plates clearer brown; antennae chestnut proximally, becoming rufous distally; legs with tarsal joints more yellow. Articles of antennae thirty, short and very

short. Ocelli small, closely crowded, arranged in three rows, the single ocellus large and contiguous with seriate ocelli; e.g., 1 + 4, 4, 3. Coxal pores small, 3, 3 (4), 4, 3. Ventral spines of first legs, 0, 0, 1, 2, 1. Ventral spines of penult legs, 0, 1, 3, 3, 1; dorsal, 1, 0, 3, 1, 1, the claws two. Ventral spines of anal legs 0, 1, 3, 2, 1; dorsal 1, 0, 2, 1, 0, the claws two. Last two pairs of coxae armed laterally as well as dorsally. Anal legs of male moderately inflated; fourth joint subquadrate in cross section, a sharp median longitudinal sulcus above.

Length 8 mm.

Locality.—The holotype, a male, was taken near Ithaca, N.Y., in Nov., 1927, by R. D. Harwood.

### A NEW GENUS AND SPECIES IN THE GRACILARIIDAE (MICROLEPIDOPTERA).

BY ANNETTE F. BRAUN,  
Cincinnati, Ohio.

#### **Protolithocolletis** new genus.

Head rough tufted on crown, face smooth. Antennae four-fifths the length of the fore wings, basal segment slightly thickened, with pecten. Labial palpi moderately long, drooping, filiform, blunt pointed. Maxillary palpi minute. Middle tibiae with closely appressed scales. Posterior tibiae with closely appressed scales above, short loose hairs beneath. Fore wings lanceolate, elongate; 3 absent, 4 absent, 5 and 6 long stalked, 8 connate with 7, 9 twice as far removed from 8 as from 10, 11 absent. Hind wings about one-half, linear lanceolate; 3 absent, 4 absent, 5 and 6 stalked.

*Genotype*, *Protolithocolletis lathyri* n. sp.

*Protolithocolletis* is closely allied to *Lithocolletis* and to *Leucanthiza*. It appears to be immediately ancestral to *Lithocolletis* with which it agrees particularly in the form of the tuft on the head and in larval and pupal habits, but from which it differs in the wing venation. Vein 8 of the fore wings, absent in *Lithocolletis*, is present in *Protolithocolletis*, but connate with 7, and veins 5 and 6, united in *Lithocolletis*, are both present, but long stalked in *Protolithocolletis*. The markings of the single species approach very closely to the hypothetical primitive color pattern of the genus *Lithocolletis* (Braun, Jour. Acad. Nat. Sci. Phila., XVI, 105-168, 1914).

#### **Protolithocolletis lathyri** n. sp.

Face white, or somewhat tinged with gray, tuft dark fuscous, mixed with white; palpi dark fuscous, inner surfaces whitish; antennae dark fuscous, faintly paler annulated, a white longitudinal streak on basal segment prolonged onto the next few segments. Thorax dark blackish fuscous, tips of tegulae and a line on each side of prothorax white. Fore wings blackish fuscous through the middle, somewhat irrorated towards margins, with bases of scales paler and tinged with golden brown. The markings consist of white spots and irregular fasciae placed as follows: a white spot at base of dorsum below fold, often and especially in males obscure or almost obliterated by fuscous scaling; a white

fascia at basal fourth, with its dorsal arm usually moved somewhat toward base; a second white fascia before middle of wing, oblique near costa, attenuated and perpendicular in the middle of the wing, expanding again below fold, the second fascia sometimes reduced to costal and dorsal spots; beyond the second fascia, three white costal spots, the first of these outwardly oblique and nearly connected with an opposite dorsal spot; the second and third inwardly oblique, the third sometimes meeting a small dorsal spot just below apex. The fasciae are inwardly and faintly outwardly black margined; the costal and dorsal spots inwardly black margined. A line of black scales in the cilia edges the more golden apex of the wing. Hind wings and cilia gray. Legs blackish, banded with dull white. Abdomen blackish fuscous above, whitish beneath. Expanse: 7.5-8.5 mm.

*Holotype*.—♂, Aweme, Man., Sept. 1, 1928 (R. M. White), reared from leaves of *Lathyrus venosus*; No. 2905 in the Canadian National Collection, Ottawa.

*Paratype*.—5 ♂, 5 ♀, Sept. 1-4; 1 ♀, Aug. 2, 1928; all reared from *Lathyrus venosus*, Aweme, Man., (R. M. White).

Dr. McDunnough informs me that Mr. Criddle's breeding notes are as follows:

"This *Lithocolletis* was reared by Mr. R. M. White from leaves of *Lathyrus venosus* in which it mines. I am informed by Mr. White that the larva spends its entire life in the mine and that the pupa and its cocoon are invariably found *within the mine*. As a rule but one larva is found in a leaflet but it is not uncommon to find two and on one occasion five were observed in a single leaflet.

"*Lathyrus venosus* is one of the commonest of our wild peas and it is met with in great abundance in all the open woods or scrubland."

The imago has the aspect of the similarly marked *Lithocolletids* of the cylindrical larval group, and without structural examination would be placed in *Lithocolletis*. The specimen bearing the August date is the only one of the series in which the basal dorsal spot is pure white.

#### NOTE ON THE OCCURRENCE OF THE MITE, *DERMANYSSUS GALLINAE* L. IN THE NEST OF A HOUSE WREN.

BY C. N. AINSLIE,

U. S. Bureau of Entomology.

Having read of mites swarming in the nests of various birds and being desirous of acquiring information on the subject, I examined the nest of a house wren, *Troglodytes aedon aedon*, Vieillot, at Sioux City, Iowa, during the summer of 1927. The young birds had the day before left the nest which was built in a small box located on a pillar of my front porch. When the box was opened and the twigs removed, there was a residue of gray powder in the box, amounting to six or seven drams. The microscope showed this powder to be composed of a seething mass of small mites in all stages of development, in countless numbers. Dr. H. E. Ewing, of the Bureau of Entomology, later pronounced them to be the common chicken mite, *Dermanyssus gallinae* L.

Since wrens have nothing in common with domestic fowls, the presence of

these mites in the nest raises an interesting question, especially since, as in this particular case, the nearest chicken pen was at least 100 feet from the wren's nest. I am informed by Dr. Ewing that this same mite has been reported from the nests of a few of our native birds, particularly from English sparrow's nests, but never in large numbers except in the case of the English sparrow.

During the entire time of nest building and incubation, this pair of wrens had been engaged in a continuous fight with the sparrows. These marauders made most persistent efforts to enter the nest through the door way, a round hole the size of a silver quarter of a dollar and at different times two of the miscreants were trapped by getting their heads wedged in the opening and were unable to free themselves. During the feeding period the wrens procured insects for their young from neighboring yards and gardens, but never, as far as observed, did they go near the chicken yard in search of worms.

In the fall of 1927 the nest box was thoroughly disinfected and this spring, 1928, was again occupied by the same pair of wrens. After the first brood was fledged, in June, the contents of the box were again examined and a mass of these same mites, not quite as numerous as last year, was removed. The same sparrow conditions prevailed as last year, the sparrows continually annoying the wrens and alighting on or near the nest box. No less than ten of these hoodlums were shot by me in defense of the wrens. The noise of the shooting did not disturb the wrens in the least. On the contrary they appeared to enjoy watching the instant destruction of their enemies and several times, after the shot, pursued the dying sparrow as it fell.

It is a common observation that sparrows will flock to the spot where chickens are being fed to mingle with the chicks in order to obtain small grain and grass seed. No other bird in this region has this habit. It is evident that the transfer of mites from the chicks would be very easy, in view of this association of individuals and, once infested, these birds would naturally, automatically, be mite carriers to other locations. This is a possible explanation of the presence of the mites in the nest of the wren and adds still another indictment to those already filed against the undesirable sparrow.

The Acting Chief of the Biological Survey reports that the chicken mite has been identified for the Biological Survey from the nest of a purple martin, where it was also probably carried by the English sparrows.

A recent report from a friend during the present year, 1928, gives the information, on good authority, that a wren's nest beneath a porch roof, also in Sioux City, Iowa, a nest so near the front door of the house that no sparrows would seem to venture or at least where they apparently did not come, had many mites not only inside the nest box but mites were seen crawling on the post below the box. No material was preserved so no determination of this mite was made. It seems probable that these were also chicken mites and they may have been brought to the porch roof by the ubiquitous sparrow. From the roof they could easily have found their way to the nest.

Further observations are needed to verify these conjectures and complete these observations.



TWO NEW SPECIES OF EREMOCORIS WITH NOTES AND A KEY  
TO THE SPECIES OF PERITRECHUS (HEMIP., LYGAEIDAE).\*

BY G. STUART WALLEY,

Ottawa, Ont.

**Eremocoris canadensis** n. sp.

*Female*.—Length 8 mm. Vertex three-fourths as broad between eyes as distance from apex of tylus to middle of vertex at a point in line with posterior margins of eyes. Ocelli large, ocellular line scarcely twice the diameter of an ocellus. Antennal segments proportioned from base, as follows:—9:14:11:11. Basal antennal slender, extending two-thirds its total length beyond apex of tylus. Bucculae not attaining bases of antennae. Rostrum attaining hind coxae, first segment reaching base of head. Rostral segments proportioned from base, as follows:—9:11:8:4. Vertex sparsely pubescent, somewhat shining, rather granulate becoming weakly transversely rugulose before eye and above antenna. A few scattered, shallow punctures on vertex between eyes. Genae smooth above becoming transversely rugulose toward gular region.

Pronotum broadest at posterior margin, lateral margins almost straight, diverging posteriorly without constriction at apex of anterior lobe. Pronotum one-eighth wider at posterior margin than its greatest length. Anterior lobe two-thirds as long as pronotum, only moderately convex, shining, with small but distinct scattered punctures, the median depression weak. Posterior lobe not sharply delimited from anterior lobe, flat, with numerous coarse punctures, the posterior margin narrowly impunctate. Ventral region of thorax shining, punctate inwardly, weakly rugulose between punctures.

Anterior femora moderately broad, armed on ventral anterior margin at basal two-fifths and apical one-third with a distinct spinose tooth. Four small teeth inwardly and behind, and six small teeth inwardly and beyond the large subapical tooth. Anterior tibiae curved, armed apically with a row of seven short teeth. Middle and hind femora distinctly longer and slightly more slender than in *ferus* (Say) and *obscurus* Van D. All femora shining, minutely and very sparsely pubescent. Tibiae without long hairs. Elytra with usual puncturation; membrane attaining apex of last abdominal tergite which is emarginate.

Color, head including antennae, anterior lobe of pronotum, scutellum, black, except for apex of tylus and first two antennal incisures which are castaneous. Posterior lobe of pronotum dark castaneous, unicolorous anteriorly with anterior lobe. Anterior, lateral and posterior margins of pronotum, rostrum, coxae, femora, anterior and posterior margins of prosternum, posterior margin of metasternum and acetabulae, dark castaneous. Tibiae and tarsi paler reddish brown. Abdominal sternites black with genital plates and line of insertion of ovipositor castaneous. Elytra testaceous brown, corium obscurely paler at base for distance subequal to length of scutellum. Membrane brown with a pale spot at outer angle of corium, this spot inwardly bordered by a small darker brownish spot; venation obscure not pale as in *ferus*.

*Holotype*.—♀, Keremeos, B. C., June 17, 1923 (C. B. Garrett), No. 2891

\*—Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

in the Canadian National Collection, Ottawa.

A larger darker species than *ferus* (Say) lacking the setose hind tibiae, with the pronotum of different shape and the antennae not pale at the base. Resembles *obscurus* Van. D. but is larger with the middle and hind femora distinctly more elongate and the basal antennal segment longer and more slender. Differs from *semicinctus* Van D. in having the third and fourth antennal segments equal, not 3:2 as in *semicinctus*.

***Eremocoris melanotus* n. sp.**

*Female*.—Length 7 mm. Vertex three-fourths as broad between eyes as distance from apex of tylus to middle of vertex at a point in line with posterior margins of eyes. Ocelli moderate in size, ocellular line subequal to twice the diameter of an ocellus. Antennal segments proportioned from base, as follows:—8.5:14.2:12.2:11. Basal antennal moderately stout, extending two-thirds its total length beyond apex of tylus. Bucculae not attaining bases of antennae. Rostrum slightly surpassing hind coxae, first segment slightly surpassing base of head. Rostral segments proportioned from base, as follows:—10:12:9:4.5. Vertex very sparsely pubescent, dullish, finely granulate, very obscurely punctate between eyes. Genae finely granulate.

Pronotum broadest at middle, lateral margins very broadly arcuate on anterior half, thence almost straight and slightly converging posteriorly. Pronotum as wide at posterior margin as its greatest length. Anterior lobe two-thirds as long as pronotum, more quadrate than in *ferus* (Say) and less convex with the posterior lobe not sharply delimited. Anterior lobe with a few obscure punctures; posterior lobe more densely and coarsely punctate. Ventral region of thorax dull and with a few scattered obscure punctures.

Anterior femora moderately broad armed on ventral anterior margin at middle and apical one-fourth with a spinose tooth. The outer tooth much stronger than the median, the former with three small teeth inwardly and behind, and four outwardly and behind. Front tibiae moderately curved, armed as in *canadensis*. Middle and hind femora slightly longer than in *ferus* (Say) and *obscurus* Van D. Hind tibiae with numerous long erect setae. Elytra with usual puncturation; membrane not quite attaining base of last abdominal tergite which is emarginate at apex.

Color, head (except apex of tylus) anterior lobe of pronotum and scutellum, black. Antennae and posterior lobe of pronotum entirely dark fuscous, almost black. Carinate lateral margins of pronotum, rostrum and apex of tylus, castaneous. Anterior and posterior margins of prosternum, posterior margin of metasternum obscurely castaneous. Acetabulae and legs castaneous the legs becoming slightly paler apically. Abdominal sternites black, genital plates with a trace of castaneous. Elytra with clavus dark testaceous brown, corium blackish except basal fourth which bears an obscure yellowish brown patch which extends for a short distance along costa. Membrane black, a very small obscure paler spot at outer angle of corium; venation obscure, not pale.

*Holotype*.—♀, Lilloet, B. C., May 27, 1925 (E. R. Buckell), No. 2892 in the Canadian National Collection, Ottawa.

The following key will aid in separating the Canadian species.

## TABLE OF CANADIAN SPECIES OF EREMOCORIS

1. Pronotum broadest at middle, the anterior lobe not well differentiated from the posterior lobe; antennae uniformly fuscous; general aspect dark .... *melanotus* n. sp.  
Pronotum broadest behind the middle or if broadest at middle then the anterior lobe is well differentiated from the posterior lobe and the antennae usually with the basal segment pale ..... 2.
2. Middle and hind femora elongate; pronotum scarcely broader than long; basal antennal segment slender; anterior pronotal lobe distinctly punctate; length 8 mm. .... *canadensis* n. sp.  
Middle and hind femora of normal length; pronotum distinctly broader than long; basal antennal segment stouter; anterior pronotal lobe impunctate or with only a few minute scattered punctures; length not exceeding 7 mm. . . 3.
3. Posterior lobe of pronotum but feebly differentiated from anterior lobe; nervures of membrane only obscurely pale; antennae uniformly dark; general aspect dark .... *obscurus* Van D.  
Posterior lobe of pronotum longer and well differentiated from anterior lobe; nervures of membrane distinctly pale; basal segment of antenna usually distinctly reddish brown; general aspect paler ..... *ferus* (Say).

**Peritrechus Fieber.**

The genus *Peritrechus* Fieber is represented in Canada by three of the four species known from America north of Mexico. The following key and notes are presented to facilitate the recognition of our species. The shape of the pronotum, structure of the antennae and punctuation of the vertex appear to be the best characters for distinguishing species.

## KEY TO THE SPECIES OF PERITRECHUS

1. Pronotum just behind front angles at least subequal to width of head across eyes ..... 2.  
Pronotum just behind front angles obviously narrower than width of head across eyes ..... *paludemaris* Barber.
2. Pronotum scarcely one-third wider than long; posterior half of pronotum only obscurely castaneous; antennae relatively stouter .... *tristis* Van D.  
Pronotum more than one-third wider than long; posterior half of pronotum ochraceous; antennae slender ..... 3.
3. First antennal barely exceeding apex of tylus; vertex with numerous fine punctures; broader carinate lateral margins of pronotum ochraceous throughout ..... *saskatchewanensis* Barber.  
First antennal exceeding apex of tylus by half its own length; vertex more coarsely punctate, the interspaces with fine obscure punctuation; narrower carinate lateral margins of pronotum unicolorous with the adjacent portion of pronotal disk ..... *fraternus* Uhler.

**Peritrechus paludemaris Barber.**

*P. paludemaris* Barb., Bul. Am. Mus. Nat. Hist., XXXIII, 516. 1914.

Type localities, Staten Isl., N. Y., Chesapeake Beach, Md. and Everglade, Fla. Subsequently recorded by Blatchley from Royal Palm Park, Fla.

**Peritrechus tristis** Van Duzee.

*P. tristis* Van D., Ent. News, XVII, 388, 1906.

Type localities, Victoria and Wellington, Vancouver Isl., B.C. The species is represented in the Canadian National Collection by specimens from Victoria, Enderby and Saanich Dist. (Downes) B. C.

This species appears most closely related to *fraternus* Uhler. In addition to the characters given in the above key it is slightly smaller, narrower and darker in color than is *fraternus*.

**Peritrechus fraternus** Uhler.

*P. fraternus*, Uhl., Proc. Bost. Soc. Nat. Hist., XIV, 103, 1871.

Recorded from Que., Ont., Mass., N. Y., N. J., Kan., N. Dak., Idaho, Colo., N. Mex., Calif., and British Columbia.

Differs from *tristis* as stated above. Distinguished from *saskatchewanensis* in having the pronotum slightly more than one-third wider than long, never twice as wide as long as in *saskatchewanensis*; also by the characters given in the above key.

**Peritrechus saskatchewanensis** Barber.

*P. saskatchewanensis* Barb., Jour. N. Y. Ent. Soc., XXVI, 60, 1918.

Described from two females, the type from Oxbow, Saskatchewan, and a paratype, Los Angeles Co., Calif. The writer has examined material as follows: L. Opasatika, Que. (Knull); Valley R., Dauphin, Man. (Hippisley); Aweme, Man. (White); Saskatoon Sask. (King); Lethbridge, Alta. (Seamans); Cranbrook, B. C. (Garrett); Aspen Grove, B. C. (Vroom); Oliver, B. C. (Garrett). The Cranbrook and Oliver specimens have the second and third antennals with their median one third dark reddish.

**A NEW CALIFORNIA EUPHYDRYAS (LEPID., RHOPALOCERA).**

BY J. D. GUNDER,  
Pasadena, Calif.

**Euphydras irelandi** sp. nov.

The chain of Rocky Mountains extending south from Canada through western Montana, Wyoming, Colorado and into northern New Mexico produce a series of butterflies which are at present referable under an *anicia-brucei* classification. Various races from this supposed parental stock are found in southwestern Colorado, Utah, the Great Basin of Nevada and elsewhere with members of the clan branching down into New Mexico. For several years I have been hoping to find representatives of this group reaching over into the Sierra Nevada Mountains of California. In 1927 when on Alta Peak in Sequoia National Park, I took two males and in 1928 Mr. Walter Ireland captured four females in the same locality which I find to be closely related to the above mentioned breed.

Their male genitalia are altogether similar, except that the dorsal (or upper hook) of the harpe is a bit shorter than that of the actual types of either nearby *wheeleri* Hy. Edw., *morandi* Gun. or *maria* Skin. and the lower hook is a trifle forked. The shape of the uncus with the direction and curve of the hooks is of the same type or derivation.

The size and shape of the wings of these specimens in both sexes is like *wheeleri* or *morandi*, but their color is a brazil red (Ridgeway, 1912). This



shade has a peculiar pinkish tone which differentiates them from other California butterflies or kindred Great Basin examples. Regarding maculation, there is a distinct feature which is evidently constant and noticeable. The upper side primaries have the usual submarginal, smaller, lunate row of white spots, followed by the larger row of roundish white spots; beyond this the band of red extending through the discal area is noticeably broad and quite wide beneath the cell. On the secondaries this discal band of red is always very broad between the submarginal lunate white spots and the exterior white flashes of the basal area designs. Beneath on the secondaries, the corresponding submarginal row of red spots also tends to be wider as a result of the upper side width. This feature (of the wider red band) is somewhat new to the *Euphydryas*, though *morandi* shows a similar tendency.

*Classification:* For the time being, I am describing these new butterflies as a species because of the rating accorded other similar races.

*Data:* Holotype ♂, 39 mm., Aug. 6, 1927, trail near Alta Peak, Sequoia Nat. Park, Calif.; Allotype ♀, 46 mm., July 17, 1928 (Ireland), same region; types in Author's collection. Paratypes—1 ♂ and 2 ♀ with same dates and locality also in Author's collection; 1 ♀ in Mr. Ireland's collection. Named after Mr. W. H. Ireland of Colingra, Calif. A Mr. Carl Walter of Anaheim, Calif. has also taken several of these species in the same locality.

*Notes:* In a complex genus like the *Euphydryas* where identification is difficult due to similar generic characters it is almost a waste of time writing or reading a description unless it is accompanied by illustration. Figures of *Euphydryas irelandi* Gun. will appear later in the year.

#### A NEW SYRPHID FROM CANADA.

BY C. H. CURRAN,

American Museum of Natural History, New York, N.Y.

##### ***Syrphus venablesi* n. sp.**

Related to *medius* Jones but lacking a brown, inverted Y-shaped frontal vitta, the lower two thirds of the front yellowish pollinose, the lower fourth to third yellow in ground color. Length 11 to 12 mm.

*Female.* Face and anterior half of cheeks yellow; a median vitta and the jowls blackish. Face and lower half of occiput with whitish pollen, the occiput above with yellow pollen and pile; facial pile yellowish, on occiput whitish, on front black. Front with or without a slender median bare vitta, strongly narrowed above, aeneous on upper third. Antennae blackish, yellowish below.

Mesonotum aeneous, the sides and pleura with greyish pollen; pile yellowish, darker laterally on mesonotum, almost white on the pleura. Scutellum reddish yellow, with more or less metallic sheen, black haired.

Legs reddish, yellow haired, posterior legs, except the broad base of the femora, black haired. Basal segment of middle tarsi without black spicules below. Apical three tarsal segments more or less brown.

Wings cinereous hyaline; stigma luteous; squamae and halteres whitish, the former with yellow fringe.

Abdomen black with reddish yellow fasciae, the first band interrupted, the

others entire, all the bands reaching the lateral margins in front or the second and third bands narrowly separated from the sides. First segment, posterior border of the following segments and the lateral margins, shining. Band on second segment situated near the middle, the inner ends of the spots rounded, the outer ends produced forwards to the base of the segment. Bands on third and fourth segments narrowly separated from base of segment, more or less distinctly concave on either side of the middle and correspondingly convex on their posterior border, rather broadly emarginate in the middle of posterior border. Broad apex of fourth segment, large, transverse basal triangles on the base of the fifth and posterior border of fifth segment reddish yellow, the black band on the fifth segment sometimes greatly reduced. Pile black; yellow on the first segment, basal two thirds of the second and on the yellow bands on the third and fourth segments, wholly black on the lateral margins beyond the middle of the second segment. Venter yellow, the second to fourth sternites with broad, incomplete brown bands, the pile yellow on the first three sternites, black and appressed on the apical sternites and on the dark band on the third.

*Male.* Frontal triangle yellow, black haired; vertical triangle black; occipital pile whitish, a few black occipital cilia. Base of femora broadly black, the posterior pair black on basal two thirds. Abdominal bands wider and more undulate.

*Holotype.*—♀, Vernon, B. C., June 30, 1928, (E. P. Venables), No. 2902 in the Canadian National Collection, Ottawa.

*Allotype.*—♂, Vernon, Sept. 16, 1928 (Venables).

*Paratypes.*—3 ♀, Vernon, Sept. 10, 1928 and ♀, Oct. 3, 1928, (Venables). Paratypes in American Museum of Natural History.

This species has been confused with *nitens* Zett. and *wiedmanni* Johns. but is more closely related to *medius* Jones and *meadii* Jones.

## OBITUARY

HARRISON GRAY DYAR.

On the 21st of January death claimed a man who for several years was the acknowledged authority on mosquito taxonomy in the Western Hemisphere and who, since the publication of his famous treatise on larval classification in 1895, had been one of the world's outstanding Lepidopterists. Dr. Dyar had been in failing health for some time but the end came suddenly and up to within three days of his death he was actively at work and nearly every day was to be found at his desk in the National Museum. He was a rapid and tireless worker and in the thirty odd years of his entomological career described hundreds of species and genera and revised several families and genera groups of the Lepidoptera. Especially noteworthy are his papers on the "Life Histories" of the North American Limacodidae, his revision of the genus *Acronycta* (in collaboration with John B. Smith, 1898), and his detailed descriptions of larvae in nearly all the macro and several of the micro families. His most imposing monument is the *Monograph of the "Mosquitoes of North and Central America and the West Indies"* (1912) in which he collaborated with L. O. Howard and the late

Frederic Knab and his own later revisionary treatise on "The Mosquitoes of the Americas"; but he probably will be remembered with most respect as the pioneer of larval classification and the one who in the great order Lepidoptera has pointed the way to a sound classification based upon a coordination of larval and adult characters.

Dr. Dyar was born in New York City Feb. 14, 1866. He graduated from the Massachusetts Institute of Technology in 1889, took his master's degree at Columbia in 1894 and his doctor's degree from the same university in '95. He was Assistant Bacteriologist of the college of Physicians and Surgeons of Columbia University from 1895 to 1897; and from 1897 until his death he held the honorary position of Custodian of Lepidoptera at the U. S. National Museum at Washington. In 1924 he was commissioned as a Captain in the Sanitary Department of the Officers Reserve Corps because of his contributions to the knowledge of American Mosquitoes. He was editor of the Journal of the New York Entomological Society from 1904 to 1907 and of the Proceedings of the Entomological Society of Washington from 1909 to 1912. From 1913 to 1926 he published and edited *Insecutor Inscitiae Menstruus*, a journal of entomology of his own founding. Throughout his career he was a prolific contributor to entomological journals. His death closed a busy life.

CARL HEINRICH.

#### BOOK REVIEW

The Principles of Systematic Entomology. By Gordon F. Ferris. 169 pp. 11 fig. Stanford University Publications, Biological Sciences, Vol. V, No. 3. 1928.

This volume attempts to supply the need for a book which considers the principles upon which systematic entomology is based and the methods by which these principles may be practised. It is primarily a discussion of the fundamental principles and philosophical background of the subject and a frankly critical survey of the existing conditions in systematic entomology. It includes a general, but not detailed, discussion of methods.

The author begins with a review of the contributions, philosophical and practical, of systematic science. He then discusses the scope of systematic biology and holds, that not the description or naming of species, but the interpreting of facts so revealed is the ultimate function of the subject. He states that the subject "is in its broad implications essentially synonymous with the study of organic evolution." He holds that the segregation of species and their minor divisions is the first step in all systematic work, and for its accomplishment the systematist should employ any available means. Definitions of species, criteria for segregating species, and categories less than species are discussed and the author maintains that no valid final conclusions can be based on preserved material alone. He believes that the greater part of systematic work must be based on morphology which is essentially synonymous with systematics and that every body structure must be considered. He emphasizes the limitations of pinned specimens as objects for careful study and the value of the microscopic slide method of mounting material. To obtain a fixed basis for systematic work, it is necessary that all data

be recorded; the description should stand as an adequate substitute for the object itself. Therefore figures are necessary, and the analyzing of the data should be the principal function of the verbal description. Entomological drafting and the description of species he discusses in a general way. The problems, philosophical and practical, in the development of a classificatory system are considered. The author discusses the training of the systematist and emphasizes the fact that only those technically trained for its accomplishment should undertake systematic work.

Dr. Ferris' reasoning is unassailable, but some of his readers will probably feel that he has given too much consideration to the philosophical and too little to the practical aspects of his subject.

The volume includes a reprint of the international rules of zoological nomenclature and abstracts of those decisions of the International Commission which bear upon entomological problems. It is well indexed and documented. Such a work has long been needed, and should be appreciated, especially by the younger entomologists.

W. J. BROWN.



